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ABSTRACT

A mirror is scanned to provide an image of a portion of the Earth to a multiband focal plane array (MBFPA) of optical detectors (an "imager"). Initially, the mirror is positioned relative to a first axis. The mirror is then scanned about a second axis and repositioned relative to the first axis while scanning the mirror about the second axis. This invention may be used in a weather satellite to remove prevent/reduce errors in pixel-to-pixel registration within an image frame and errors in band-to-band that occur when the various imaging bands (e.g., visual and infrared) of the MBFPA are used to image or scan selected areas of the Earth. The present invention positions the mirror relative to the first axis (e.g., elevation), and while scanning the mirror about the second axis (e.g., azimuth), the mirror is regularly repositioned in a prescribed manner relative to the first axis. That is, the invention dynamically adjusts the position of the mirror relative to the first axis while scanning about the second axis. Scanning about the first axis may be an elevation scan while scanning about the second axis may be an azimuth scan, or vis-a-versa. Advantageously, this control technique ensures that the images within each spectral band are spatially registered pixel-by-pixel within the image frame, and that the images of the various spectral bands are spatially coregistered with respect to each other. The present invention provides a scan-control technique for a single-mirror scan system that enables the use of the MBFPA in an imaging instrument.

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